



Hemchandracharya North Gujarat University PHD Exam

Exam Name : HNGU_PHD_BioTech_31.01.2024_12.00 PM TO 02:00 PM

Exam Date : 2024-01-31

Exam Time : 12:00:00 PM To 02:00:00 PM

Total Marks : 100

Note : The correct answer is indicated by the green color. સાચો જવાબ લીલા રંગ દ્વારા સૂચવવામાં આવે છે.

Question List:

Section: Section-A

- What is the first stage of the research process? [1 Mark]
 - Collect and analyse the data
 - Develop and implement the research plan
 - Report the findings
 - **Define the research problem**
- Qualitative approach of research is not concerned with [1 Mark]
 - Subjective assessment of attitudes
 - Opinions and behaviour
 - Subjective assessment of attitudes, opinions and behaviour
 - **None of these**
- A Type I error can occur when the null hypothesis is [1 Mark]
 - **rejected**
 - accepted
 - Depends upon the population
 - None of these
- A hypothesis is a [1 Mark]
 - Law
 - Postulate
 - **Supposition**
 - Canon
- One of the importance of providing reference in your academic assignment is [1 Mark]
 - to show that your ideas are worthy
 - **to distinguish your ideas from others**
 - to persuade the readers
 - None of these
- A review that only demonstrates familiarity with an area is rarely published but it often is part of an educational program is which type of review? [1 Mark]

- Integrative reviews
 - Theoretical reviews
 - **Self-study reviews**
 - Historical reviews
- **A research focuses on statistical analysis of numerical data collected through the use of large-scale, survey research, using methods such as questionnaire or structured interview is known as [1 Mark]**
- Fundamental research
 - **Quantitative research**
 - Applied research
 - Qualitative research
- **Illegal use of someone's work without proper citations is known as [1 Mark]**
- **Plagiarizing**
 - Cheating
 - Citing
 - Referencing
- **The purpose of simple linear regression analysis is to: [1 Mark]**
- Replace points on a scatter diagram by a straight line
 - Obtain the expected value of the independent random variable for a given value of the dependent variable
 - **Obtain the expected value of the independent random variable for a given value of the dependent variable**
 - None of these
- **Which of the following is another term for a Hypothesis Test? [1 Mark]**
- Level of significance
 - Test statistic
 - **Test of significance**
 - No tailed test
- **In a thesis, figures and tables are included in [1 Mark]**
- Separate chapter
 - The concluding chapter
 - The text itself
 - **Appendix**
- **How do you find degrees of freedom for a chi-square goodness of fit test? [1 Mark]**
- **One less than the sample size**
 - One less than the population
 - Half of total sample size
 - Twice the total sample size
- **Scientific writing should be [1 Mark]**
- Clear
 - Brief
 - Concise
 - **All of these**
- **Which of the following section is NOT the part of the Research Proposal? [1 Mark]**
- Introduction
 - **Data Analysis**
 - Literature review
 - References
- **What is the standard font size for the research paper? [1 Mark]**
- 11
 - 14
 - **12**

▪ 16

- **What is the range of possible values for the correlation coefficient? [1 Mark]**
 - 0 to 1
 - -1 to 0
 - -10 to 10
 - **-10 to 10**

- **Two major types of Descriptive research are [1 Mark]**
 - Observation method and decisional method
 - **Observation method and survey method**
 - Survey method and theoretical method
 - None of these

- **When citing a journal article, what is the format for the volume, issue, and pages number? [1 Mark]**
 - **Volume No. (Issue No.) Pages No.**
 - Volume No., Issue No., Pages No.
 - (Volume No.) Issue No., Pages No
 - Volume No., Issue No. (Pages No.)

- **What is an appropriate rule for writing three or more than three authors in research paper? [1 Mark]**
 - Lead author's name, comma, etc.
 - Lead author's name, comma, n.d.
 - **Lead author's name, comma, et al.**
 - Lead author's name, comma, ed.

- **Which punctuation is used to separate the information in a bibliography entry? [1 Mark]**
 - Comma
 - Exclamation point
 - Quotation mark
 - **Period**

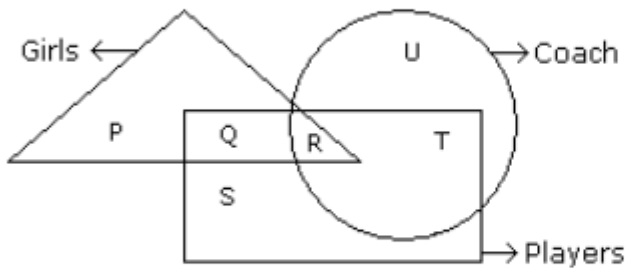
- **What is the purpose of the thesis? [1 Mark]**
 - To remind your reader what is your paper is about
 - To hook the reader's attention
 - **To state your opinion or claim and prove it**
 - To use vocabulary words

- **Choose the pair that best represents a similar relationship to the one expressed in the original pair of words EXPLORE : DISCOVER [1 Mark]**
 - read : skim
 - **research : learn**
 - write : print
 - think : relate

- **Which of the following is found necessarily in milk? [1 Mark]**
 - Cream
 - Curd
 - Water
 - **Whiteness**

- image [1 Mark]

In the following figure triangle represents 'girls', square players and circle-coach. Which part of the diagram represents the girls who are player but not coach?



- a. P
- b. Q
- c. R
- d. S

- A
- **B**
- C
- D

- What is the maximum number of pieces that a pizza can be cut into by 7 knife cuts? [1 Mark]

- 21
- 42
- 14
- **29**

- A paragraph is a group of [1 Mark]

- Words arranged in logical sequence
- **Sentences arranged in a logical sequence**
- Sentences arrange in any random order
- Words arranged without logical sequence

- Dwarfish is a better word for [1 Mark]

- Huge
- **Small**
- Tall
- None of these

- If today is Monday, then after 61 days the day will be [1 Mark]

- Tuesday
- Thursday
- **Saturday**
- Friday

- Image [1 Mark]

Find the missing number

6	9	15
8	12	20
4	6	?

- a. 20
- b. 10
- c. 15
- d. 25

- A
- **B**
- C
- D

- Which of the following are examples of search engines? [1 Mark]

- Word and Excel
- Internet explorer and Firefox
- **Yahoo and Google**
- Word and PowerPoint

- What type of computer has a main purpose of serving other computers on a LAN? [1 Mark]

- Client
- **Server**
- Computer
- Microcomputer

- What does every formula in MS EXCEL to start with? [1 Mark]

- +
- -
- *
- =

- Text editors are programs that help us to [1 Mark]

- **Write & edit**
- Listen to music
- Draw a picture
- Play a game

- In MS word, Tables, shapes, images, charts, graphs, header, etc. They are included in the _____ category [1 Mark]

- Review
- Home
- **Insert**
- Page Layout

- The child responded to his mother's demands _____ throwing a tantrum. [1 Mark]

- with
- **by**
- from
- in

- Choose the correct form for Passive Voice “They make shoes in that factory” [1 Mark]

- Shoes will be made in that factory

- Shoes were made in that factory
 - **Shoes are made in that factory**
 - Shoes are make in that factory

- **Which of the following practices is an effective way to avoid plagiarism in research [1 Mark]**
 - **Appropriately citing the sources of all quotations, ideas, or data taken from others**
 - Directly copying and pasting text from an online article without citations
 - Paraphrasing text heavily from an original source without giving credit
 - Citing only direct quotations but not ideas that have been paraphrased

- **If the population variance is unknown and the sample size is small, then which test is applicable? [1 Mark]**
 - **t-test**
 - z-test
 - chi-test
 - None of these

- **Why do we randomly select our samples? [1 Mark]**
 - to increase bias
 - **to reduce bias**
 - because it's easier
 - None of these

- **Which of the following is a small portion of the population used to gather data [1 Mark]**
 - Bias
 - Systematic Sampling Method
 - **Sample**
 - Population

- **In what kind of research, the researcher has to use facts or information already available [1 Mark]**
 - **Analytical research**
 - Descriptive research
 - Applied research
 - Distinctive research

- **A Blue print of Research work is known a [1 Mark]**
 - Sampling design
 - **Research design**
 - Research hypotheses
 - Research approach

- **Title of the thesis must be the same as [1 Mark]**
 - **The title of your synopsis**
 - The title of your research paper
 - Any of previous work in the same field
 - Any of the previous work in another field

- **The random error can be assessed [1 Mark]**
 - Empirically
 - **Statistically**
 - Experimentally
 - By performing sensitivity analysis

- **The hypothesis that two groups are the same [1 Mark]**
 - Alternative hypothesis
 - Experimental hypothesis
 - Statistical hypothesis
 - **Null hypothesis**

- **In how many phases the transaction executed in the validation-based protocol? [1 Mark]**

- 1
 - 2
 - **3**
 - 4
- **If the correlation coefficient is 0, then what we can say [1 Mark]**
 - **No linear relationship**
 - Weak positive correlation
 - Perfect negative correlation
 - Linear relationship
 - **The correlation between time and speed is [1 Mark]**
 - Positive
 - **Negative**
 - Zero
 - Mixed
 - **Simple linear regression requires that the scales of measurement be expressed in either [1 Mark]**
 - Nominal or ordinal
 - Ordinal or ratio
 - **Interval or ratio**
 - Nominal or interval
 - **The z-test is applicable when sample size is greater than [1 Mark]**
 - 20
 - 10
 - 100
 - **30**

Section: Section-B

- **Which one of the following statements is NOT true? [1 Mark]**
 - Beta-oxidation of long chain fatty acids occurs in mitochondria
 - **Fatty acid biosynthesis occurs in peroxisomes**
 - Peroxisomes utilize H₂O₂ to oxidize a variety of substrates
 - Peroxisomes import their repertoire of proteins using sorting signals
- **Rotenone is an inhibitor of the electron transport chain. The addition of rotenone to cells results in which of the following? [1 Mark]**
 - **Generation of mitochondrial reactive oxygen species and block in ATP generation.**
 - Block in ATP generation but no generation of reactive oxygen species.
 - Generation of reactive oxygen species but no block in ATP generation.
 - Permeabilization of the inner membrane to compounds which are usually not able to traverse the membrane.
- **Which one of the following pair of amino acids are glucogenic and ketogenic in nature? [1 Mark]**
 - Alanine and Lysine
 - Lysine and Leucine
 - **Isoleucine and Phenylalanine**
 - Aspartate and Lysine
- **Which one of the following small molecule neurotransmitters is NOT synthesized from tyrosine? [1 Mark]**
 - Epinephrine
 - Dopamine
 - **Serotonin**
 - Norepinephrine
- **Catabolic end product of purines is [1 Mark]**
 - Xyloric acid

- Allantoin
 - Urea
 - **Uric acid**
- **Protein kinases phosphorylate proteins at hydroxyl groups on amino acid side chains. Which one of the following groups of amino acids contain side chain hydroxyl groups? [1 Mark]**
 - Aspartate, glutamate and serine
 - **Serine, threonine and tyrosine**
 - Lysine, arginine and proline
 - Threonine, phenylalanine and arginine
- **The second messenger, which opens calcium ion pores in endoplasmic reticulum and plasma membrane is [1 Mark]**
 - Diacylglycerol
 - cAMP
 - Phosphatidyl inositol biphosphate
 - **Inositol triphosphate**
- **The cell maintains a high concentration of protons inside the lysosome because of [1 Mark]**
 - antiporter in the lysosomal membrane
 - **ATPpowered proton pump in the lysosomal membrane**
 - facilitated diffusion proton channel in the lysosomal membrane
 - facilitated diffusion proton uniporter in the lysosomal membrane
- **Which one of the following permits the rapid diffusion of small, watersoluble molecules between the cytoplasm of adjacent cells? [1 Mark]**
 - Tight junctions
 - Anchoring junctions
 - Adherens junctions
 - **Gap junctions**
- **The translocation into which one of the organelles listed below DOES NOT depend on an amino acid sequence as a signal for import? [1 Mark]**
 - Nucleus
 - a. Endoplasmic reticulum
 - **Lysosome**
 - a. Peroxisome
- **Nitric oxide (NO) acts as intracellular second messenger by stimulating [1 Mark]**
 - Phosphodiesterase
 - Nitric oxide synthase
 - Adenylyl cyclase
 - **Guanylyl cyclase**
- **Individual chromosomes are clearly seen during which phase of the cell cycle? [1 Mark]**
 - G0
 - G1
 - S
 - **M**
- **Which one of the following is abundant in the plasma membranes of mammalian cells but is absent from most prokaryotic and plant cell [1 Mark]**
 - Phosphoglycerides
 - Ergosterol
 - Cholin
 - **Cholesterol**
- **5S rRNA is transcribed by transcribed by which of the following RNA polymerase? [1 Mark]**
 - RNA polymerase I
 - RNA polymerase II
 - **RNA polymerase III**

- All of these
- **Deamination of bases is a common chemical event that produces spontaneous mutation. Which one of the following bases will be formed by deamination of 5 methylcytosine? [1 Mark]**
 - Uracil
 - **Thymine**
 - Cytosine
 - Guanine
- **Which one of the following inactivates the serine/threonine protein kinase, mTOR, related to cell growth in mammalian system? [1 Mark]**
 - Rifamycin
 - **Rapamycin**
 - Erythromycin
 - Chloramphenicol
- **On sequence analysis of a double stranded DNA, the results showed the content of cytosine, C was 20%. What is the amount of A and T put together? [1 Mark]**
 - 20%
 - 30%
 - 50%
 - **60%**
- **Which one of the following ensures stable binding of RNA polymerase at the promoter site? [1 Mark]**
 - DNA photolyase
 - **Sigma factor**
 - DNA glycosylase
 - Rec A
- **In humans, the enzyme analogous to reverse transcriptase activity is: [1 Mark]**
 - Ribonuclease P
 - Ribonuclease D
 - Recombinase
 - **Telomerase**
- **Nucleic acid structures are stabilized by [1 Mark]**
 - hydrophilic interactions
 - covalent interactions
 - covalent and hydrophilic interactions
 - **hydrophobic interactions and hydrogen bonding**
- **The cells of inner cell mass of a blastocyst stage mammalian embryo are [1 Mark]**
 - totipotent
 - **pluripotent**
 - multipotent
 - unipotent
- **What is the pattern of cleavage observed in mammals? [1 Mark]**
 - radial
 - spirial
 - **rotational**
 - bilateral
- **Cardiac and cerebral tissues are derived from the following germ layers respectively [1 Mark]**
 - Ectoderm and mesoderm
 - **Mesoderm and ectoderm**
 - Mesoderm and endoderm
 - Endoderm and ectoderm

- **To which class of Drosophila developmental genes does fushi tarazu (ftz) belong? [1 Mark]**
 - Gap genes
 - Segment polarity genes
 - **Pair rule genes**
 - Maternal effect genes

- **Which one among the following is the correct function of leghaemoglobin? [1 Mark]**
 - **It sequesters oxygen to facilitate nitrogen fixation**
 - It protects nitrogenase from CO₂
 - It facilitates the supply of CO₂ to nitrogen fixing bacteria
 - It binds to nitrogen and moves it out of the nodule

- **Nitrification during nitrogen cycle is the production of: [1 Mark]**
 - Ammonium
 - **Nitrates**
 - Nitric oxide
 - Nitrogen

- **In leguminous plants, both the rhizobium genes and the plant genes influence nodulation and nitrogen fixation. Which one of the following functions is NOT encoded by the host plant genes? [1 Mark]**
 - Production of inducers that modify rhizobia cell wall
 - Production of flavonoid inducers
 - Establishment of contact between bacteria and legume
 - **Root hair curling**

- **Vincristine and vinblastine, two commercially important secondary metabolites from Catharanthus roseus, are examples of [1 Mark]**
 - **alkaloids**
 - flavonoids
 - terpenoids
 - steroids

- **Which one of the following hormones is responsible for mobilizing calcium from the bone and increasing urinary excretion of phosphate? [1 Mark]**
 - Calcitonin
 - Angiotensin
 - **Parathormone**
 - Vasopressin

- **Which one does NOT occur as a physiological adjustment during heat acclimatization? [1 Mark]**
 - Lowered threshold for start of sweating
 - Effective distribution of cardiac output
 - Improved skin blood flow
 - **Increased salt concentration of sweat**

- **Bowman's capsules are present in which ONE of the following organs/ tissues? [1 Mark]**
 - **Renal cortex**
 - Urinary bladder
 - Renal medulla
 - Ureter

- **The Organ of Corti is found in which of the following parts of human body? [1 Mark]**
 - Heart
 - **Inner ear**
 - Kidney
 - Nasal cavity

- **Which one of the following leukocytes are present in the largest proportion in healthy human blood? [1 Mark]**

- **Neutrophils**
 - Eosinophils
 - Basophiles
 - Monocytes
- **In plants the maternal influence in extra-nuclear inheritance owes to [1 Mark]**
 - Kappa particles
 - Ergastic substances
 - Centrosomere
 - **Chloroplast**
- **Complementation analysis which is a genetic test helps us to [1 Mark]**
 - **Determination of two mutations are on the same gene**
 - Whether one of the parents is homozygous for dominant allele
 - Whether one of the parents is homozygous for the recessive allele
 - Whether the parents are heterozygous
- **For barcoding of an animal species most conserved molecule used is [1 Mark]**
 - Nuclear DNA
 - **Mitochondrial DNA**
 - mRNA
 - tRNA
- **When change in the phenotype or gene expression occur without changes in the underlying DNA sequence, the phenomenon is called [1 Mark]**
 - Mutation
 - **Epigenetics**
 - Epistasis
 - Nucleosome sliding
- **Which one of the following chemical mutagens is incorporated into the genome by DNA polymerase during genome replication [1 Mark]**
 - Alkylating agent
 - **Base analogs**
 - Deaminating agents
 - Intercalating agents
- **An increase in the inbreeding coefficient, F₁ is likely to result in [1 Mark]**
 - Higher proportion of genes that show linkage
 - Higher proportion of genes with introns
 - Lower level of difference between proteins in two daughter cells
 - **Reduced likelihood of heterozygotes being present in populations**
- **One of the following larvae during development give rise to triploblastic-coelomate animal? [1 Mark]**
 - Planula
 - Ephyra
 - **Miracidium**
 - Trochophore
- **One of the following animals is considered to be 'living fossil' [1 Mark]**
 - Dodo
 - **Latimeria**
 - a. Protopterus
 - a. Amphioxus
- **The larva of which phylum of animals is bilaterally symmetrical though the adult form shows radial symmetry ? [1 Mark]**
 - Annelida
 - a. Coelenterata
 - Mollusca

- **a. Echinodermata**

- Speciation that occurs when biological populations of the same species become isolated from each other to an extent which prevent genetic interchange [1 Mark]
 - Sympatric speciation
 - **Allopatric speciation**
 - Para patrie speciation
 - Peripatric speciation
- Ion exchange chromatography depends on [1 Mark]
 - Size of the molecule
 - **Net charge and charge distribution on molecule**
 - Size and charge of the molecule
 - All of these
- The following statement about radioimmuno assay technique is not true [1 Mark]
 - It is based on antigen-antibody interaction
 - **The enzyme is radio labelled**
 - The antigen is radio labelled
 - It is a competitive assay
- Acid fast staining, characteristic of mycobacteria appears to be due to which of the following cell wall constituents? [1 Mark]
 - **Mycolic acid**
 - Lipopolysaccharide
 - Lipid-A
 - N-acetyl muramic acid
- Which of the following combinations of techniques is used in 2-dimensional electrophoresis? [1 Mark]
 - Native gel electrophoresis followed by electrophoresis in the presence of urea
 - **Isoelectric focussing followed by SDS-PAGE**
 - SDS-PAGE followed by Isoelectric focussing
 - Isoelectric focussing followed by native gel electrophoresis
- The first attempt at gene therapy in humans was using the following gene to overcome SCID, [1 Mark]
 - **gene for adenosine deaminase**
 - gene for tyrosinase
 - gene for recombinase
 - recombination activating gene
- Which culture technique is used for the development of haploid plants ? [1 Mark]
 - **Anther**
 - Organ
 - Somatic cells
 - Embryo
- Which one of the following is not correctly matched? [1 Mark]
 - Golden rice- Carotenoids
 - Insect resistant cotton- BT
 - Herbicide tolerant soyabean- 2,4-D
 - **'Flavr-Savr' tomato- Ferritin**